

International Conference on Education and Educational Psychology (ICEEPSY 2011)

Metacognition education and moral reasoning: a case report of high school girls in Iran

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Abstract

The majority of metacognition education studies in Iran are focused on academic achievement (Ebrahimi ghavam1998). As result the effects of this education on the promotion of moral reasoning and ethical behavior is not fully understood. Regarding the finding of Swanson and hill (1993) stemming on this hint that the people who have learned more strategies in various features, including moral activities and have saved these matters in their long term memory, are more probable of using knowledge in their own moral reasoning functions. The present study is to investigate the relationship between these two variables.

Aims: Determining the effects of metacognitive education, moral reasoning and behavior in first grade high school girls.

Methodology: The design of study is based on a two group experimental study with pre-test and post-test The sample population was consisted of 32 first grade randomly selected high school girls .Which of them consisted the case group and the other 16 students were in control group . The mean age was 15 year \pm 4 months. The survey tools were 3sets of questionnaires of metaconitive knowledge (Swanson and Hill1993), ethical behavior rating scale and moral reasoning .The intervention plan consisted of 8 ninety minutes sessions. The data analyses methods was student's t analysis.

Results: Metacognition education in both moral reasoning and metacognitive knowledge (person- task – strategy) showed a significant difference between two groups .But in the case of ethical behavior , although a significant difference was not obtained between two groups , a significant difference between pre-test and post-test was observed in the experiment group.

Conclusions: metacognition education was found to be effective in development of metaconitive knowledge and its related variables(person-task-strategy) and also reasoning . In order to obtain better results, it is suggested that a longer period of educational sessions be used and also the contents of the educational materials should be revised so that more reliable outcomes would be achieved.

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Key words: metacognitive knowledge, ethical behavior, metacognition education

Introduction

Theoretical application of metacognition in the mental and behavioral reasoning can be referred since these two concepts affected by cognitive monitoring (Kohlberg, 1981). Regarding this matter of fact that metacognition education helps developing of moral metacognition in students, and ultimately affects their moral behavior, is the main stem of this study.

According of (Flavell, 197; Flavell 1981), the term metacognition is a regulatory system that includes knowledge, expression, goals and strategies. Child's social development Grounds such as moral judgment self-evaluation change with growing and increase in age (Mohseni, 2005). Piaget believes that moral judgment depends on cognitive development. According to him, moral develops the same as intelligence and these stages depend on cognitive development and each stage will be followed by higher level of moral awareness (Kadivar, 2001). Psychologist value the importance of meta cognition and believe that cognitive monitoring, happens somewhere between actions and interactions of metacognition knowledge. Learners in information processing organization is based upon knowledge of this organization regarding itself. This knowledge, in Piaget's view, is called the ability to think about thinking and its beginning is reoffered to originate from adolescence (Mohseni, 2005). Swanson and Mashman (1995), believe that metacognitive theories that are produced by a person, organize his metacognition knowledge and understand and design his cognitive actions in an organized way.

Theoricians such as Piaget and Kohlberg, consider moral judgment and moral behavior as the basis of moral actions (Kohlberg 1981, Piaget 1932, 1981).

Moral metacognition reveals the person's knowledge or awareness of moral education and processes (Swanson and Hill 1993). In the situation of moral reasoning or behavior, whole knowledge and belief on being moral is saved in long term memory are called again (Swanson and Hill, 1993).

Swanson and Hill, divide Meta moral matters into 3 parts, including self, strategy and task.

Knowledge on self is consisted of the person's information about general and specific differences which can have an impact on his behavior. It seems that people who have more information on their own memory powers, use these knowledge and moral beliefs in their reasoning's and actions.

Regarding moral knowledge with relation to task, it should be stated that monitoring and controlling behaviors depends on the child's understanding of task specifications (Flavell, 1979).

The child who has better understanding of goals, condition and other essential elements for moral action, is more likely to show higher levels of moral behavior.

Moral knowledge in the context of strategies: certain strategies our suitable designs in moral action are under the control of a person's awareness (Flavell, 1979, Swanson and Hill 1993). As a result the children, who have more saved strategies for their moral actions, will use these strategies in their moral actions. There are valuable evidence that cognitive abilities develop with children's growth and their knowledge based thinking control (Wenden, 1991). Child's knowledge of mental conditions, strategies and tasks lead to organization of this knowledge into a systematic understanding (Mohseni, 2005).

According to several studies, it seems that metacognitive knowledge tasks action from early years of childhood but with child's growing up and at least till adolescence, continues to progress. Adults in comparison to children, have a richer knowledge of self-cognition and can describe it better.

Metacognitive education programs in relation to a vast variety of different cognitive, emotional and social contexts have been studied (Swanson 1990; Salarifar 1996, Ebrahimi ghavam1998). Better comprehension check (cross and paris 1998, Ebrahimi ghavam1998) and casual statement are related to better cognitive action and increase it with regard to task orientations.

In addition to the 3 aspect of metacognitive knowledge, Berks, has introduced self-regulation process .From her view, knowledge on cognitive processes should lead to its usage during problem solving. Self-regulation means continual management of work process in relation to goal, reviewing and directing successful efforts (Mohseni, 2004).

Teachers can help students in relation to self-regulation. They can strengthen the knowledge of task demands in children and with use of asking questions, help them indirectly to use strategies while facing a problem.

With internalization of these behavioral trends, the children make them a part of their self-regulatory powers. In this regard, the theory of vigotesky has been the basis for many studies on metacognition exercises and their effect on children's output (Brown, 1998).

In order to enable students to have knowledge- gaining abilities and gain cognitive and metacognitive skills, they should have essential motivation and be prepared and also should be able to integrate their new information in their own lives. The findings of many studies are optimistic with regard to strategic education and its progress (Cohen and themson, 2005, Glaser, 1985, Kim, 2005 ,Najar ,1996).

Talebzadeh (2002) in a study on the relationship between metacognition and moral reasoning and behavior, with a study sample of high school boys in Tehran, found out that there is a positive and significant relationship between moral metacognition and moral reasoning and behavior.

In general there is an essential need to investigate metacognition and its different aspects.

The present study is designed to investigate:

- 1- The effect moral metacognition education on moral reasoning of first year high school girls.
- 2- The effect moral metacognition education on moral behavior of first year high school girls.

Materials and Methods

The present study is of an experimental nature and there is a control group with pre/post – experiment case group. Study sample consisted of 23 high school girls studying at the first grade in the city of Tehran in 2009.16 to these students were in study group and the other 16 were at control group .Mean age was 15yrs±4months and were a medium educational progress level.

Measurements tools

In this study these tools were used:

- a. Moral metacognition test (Swanson and Hill, 1993)
- b. Moral behavior inventory (Swanson and Hill, 1993)
- c. Moral reasoning test (Short form , 3 stories , Rast, 1971).

Metacognition education scheduled:

The aim of this schedule was to develop student's skills of self-cognition process , so that the learner gains the ability to design , direct , monitor , evaluate and when suitable ,change her own educational and cognitive activities . Metacognitive knowledge is used by learners to tune the information content and applying strategic learning. For instance, the learner can analyze the situation and then makes personal plans and programs in order to achieve it. The contents of such program are prepared based on concepts and definitions of metacognition. In order to make the subject group more familiar with the topic, a manual schedule. The educational method was according to participatory mutual teaching technique (Brown, and Palincsar 1987) and role play .

The main and final goal of this program was transferring it to other context such as moral s context.

Educating metacognitive strategies to the subject group was conducted via 5 sessions of 90 minutes in four stages that each stage had several steps (table1). After the last session , the post-test was conducted ,using the 3

questionnaires of meta-moral ,moral behavior inventory and moral reasoning in both the case and control groups.

Table1: steps of educating metacognitive strategies

| stage | Goals | | Session | Session duration(min) |
|--------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------|
| First | Educating strategies and determining goal and planning | 1. Expressing the importance and main topics of the educational course | first | 80 |
| | | 2. Introducing the curriculum based on goals | | |
| | | 3. Presenting a pattern for scheduling the course | | |
| | | 4. Expressing the schedule briefly | | |
| | | 5. Reviewing and correcting the tasks | | |
| | | 6. Educating scheduling for studying a text with emphasis on tracking it's goal and choosing proper cognitive strategy for it's understanding | Two | 20 |
| Second | Educating strategies of main points | 1- Explaining the strategies for main point of a text and it's importance | Three | 90 |
| | | 2- Presenting a pattern for educating how to understand key point. | | |
| | | 3- Presenting a group exercise in relevance of this strategies. | | |
| | | 4- Outlining a task for next session. | | |
| Third | Educating control and monitoring strategies | 1- Explaining general point on control and monitoring strategies and it's importance and also the importance of evaluating work progress . | Four | 90 |
| | | 2- Presenting a pattern for monitoring and evaluation | | |
| | | 3- Doing a group exercise in relevance with this strategy. | | |
| | | 4- Outlining a task for next session | | |
| Forth | Educating the 3 strategies together | 1- Explaining briefly all the 3 strategies (by students). | five | 90 |
| | | 2- Presenting a pattern for simultaneous usage of the 3 strategies (by students) in groups with regard to moral discussions (role play methods) | | |

Data analysis

The study was of an experimental one with case –control groups and pre-test/post-. Parametric t-test was used for independent groups.

Results

According to table 2, result of independent t-test on the means of the groups for moral reasoning shows that there is significant difference between the two groups ($t = -3/0869$, $P_{\text{value}} < 0/001$).

Table2: result of independent t test for moral reasoning variable

| Group | N | Mean pre/post test | Standard deviance | Difference mead | Difference means Two group | T | Freedom degree | p |
|--------------|----|--------------------|-------------------|-----------------|----------------------------|--------|----------------|-------|
| experimental | 14 | -6/57 | 6/536 | -6.57 | -5/5 | -3/869 | 26 | 0/001 |
| control | 14 | -1/07 | 3/452 | -1/07 | | | | |

Table 3: result of independent t test for moral behavior variable

| Group | N | Mean pre/post test | Standard deviance | Difference means Two group | T | Freedom degree | p |
|--------------|----|--------------------|-------------------|----------------------------|--------|----------------|-------|
| experimental | 14 | -3/07 | 8/435 | -2/5 | -1/028 | 26 | 0/001 |
| control | 14 | -0/57 | 10/234 | | | | |

As table 3 reveals, independent t-test of the means of case and control groups for moral behavior shows a non-significant difference between the two groups ($t = -1/028$, $P_{\text{value}} < 0/001$) and with 0/99% confidence we can state that metacognition education has no meaningful effect on moral behavior .

Table4: result of independent t test for person variable

| Group | N | Mean pre/post test | Standard deviance | Difference means Two group | T | Freedom degree | p |
|--------------|----|--------------------|-------------------|----------------------------|--------|----------------|-------|
| experimental | 14 | -4/7500 | 5/04308 | -4/5893 | -3/033 | 26 | 0/001 |
| control | 14 | -0/1607 | 2/57504 | | | | |

Table 4 presents the results of independent t-test on the differences between the averages of person variable between the two groups. As it can be derived from these results, there is a significant difference between the groups ($t = -3/259$, $P_{\text{value}} = 0/001$).

Table5: result of independent t test for task variable

| Group | N | Mean pre/post | Standard deviance | Difference means | T | Freedom degree | p |
|-------|---|---------------|-------------------|------------------|---|----------------|---|
|-------|---|---------------|-------------------|------------------|---|----------------|---|

| | | test | | Two group | | | |
|--------------|----|---------|---------|-----------|--------|----|-------|
| experimental | 14 | -1/6250 | 1.50560 | -1/3214 | -3/259 | 26 | 0/001 |
| control | 14 | -0/3036 | 1/62368 | | | | |

In analyzing the data on the task variable and its differences between the groups , a significant difference is observed (table 5).(t=-3/25, P_{value}<0/001).

Table6: result of independent t test for use strategy variable

| Group | N | Mean pre/post test | Standard deviance | Difference means Two group | T | Freedom degree | p |
|--------------|----|--------------------|-------------------|----------------------------|-------|----------------|-------|
| experimental | 14 | -2/80 | 5/04308 | -2/29 | -3/42 | 26 | 0/001 |
| control | 14 | -0/52 | 2/57504 | | | | |

As another part of the data analysis , the means of the case and control groups on the strategy application were compared with independent t-test ,here again , a significant difference is achieved (t= -3/259,P_{value}<0/001).

Discussion

In general, it can be concluded from the findings that metacognitive strategy education has shown its effect on all the variables (moral metacognition , moral reasoning , person , strategy and task),and moral behavior variable was an exception , showing on significant difference between case and control groups. The findings showed that metacognition education has a positive impact on moral reasoning .This findings showed that metacognition education has a positive impact on moral reasoning .This finding is similar to the found a positive ,significant relationship between these two variables. Regarding this fact that moral metacognition refers to the person's knowledge of principles and process of moral matters (Swanson and Hill,1993), it is possible to increase the person's awareness of principles and processes of moral matters via metacognition education. As a result, people reveal the amount of moral reasoning according to their knowledge on moral context.

Another part of findings showed a no-significant statistical difference between the case and control groups in relation to moral behavior , which is not according to the findings of Swanson and Hill (1993) and Talebzadeh (2002) .This can be due to specific peer biases in the students that led to same score in pre-test and post-test to the case and control group members. However , ecological and cultural factors can also play a role in such situations i.e. family or school accepted behavioral norms and criteria ,can facilitate outbreak of specific behaviors on the other hand , one should consider the aspects of behavioral exercise effects on showing moral behaviors and it needs reviewing the curriculum of this subject so that with providing several opportunities can ease exercising moral behavior other findings of this study showed that metacognition education has a positive effect on recognizing the task's nature that are in accordance with Swanson and Hill's findings in(1993) .The child who has a better understanding of goals , situations and factors needed for performing moral behavior ,is more likely to reveal higher level of moral behaviors in comparison to a child who fails to understand the task fully (Swanson and Hill,1993).

The strategy variable showed a significant difference between case and control groups and such result is similar to the findings of salarifard (1986), he also showed that there is a significant difference in person and strategy of the students with low and high school achievement.

Gaining and applying metacognition strategies is also effective in organizing the contributing factors in knowledge on cognition and cognitive monitoring (Najar, 1999).

From the findings of the present study , the following educational application:

- Training the teachers on metacognition matters so that their student become able to manage their problems with a metacognitive strategy.
- The educational content and the expectations from the students should not exceed their metacognitive development .
- Presenting a knowledge based and purposeful education instead of giving advice .
- Using metacognition education for moral development of the students with a weak moral development.

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